

## CLAIMS

What is claimed is:

- Sub A1
1. An apparatus for use with a body to be tested for faults using a luminescent material, said apparatus comprising at least one LED capable of emitting radiation to excite said luminescent material, and a power supply connected to said at least one LED to provide said LED with electricity.
  2. The apparatus of claim 1, wherein the radiation emitted by said LED is near ultraviolet radiation.
  3. The apparatus of claim 1, wherein the radiation emitted by said LED is ultraviolet radiation.
  - Sub A2 4. The apparatus of claim 1, further comprising a housing having an open end, wherein said at least one LED is attached to a substrate and is mounted within said housing adjacent the open end, and said LED is oriented to emit radiation through the open end.
  5. The apparatus of claim 4, having at least two said LEDs arranged in an array.
  - Sub A3 6. The apparatus of claim 5, wherein said array having between 12 and 40 LEDs arranged in a cluster, and said power supply is contained within said housing.
  7. The apparatus of claim 6, wherein said power supply supplies electricity to said LEDs in an amount greater than the rated voltage of said LEDs.
  8. The apparatus of claim 6, further comprising a lens mounted to said open end for focusing said radiation emitted by said LEDs.
  9. The apparatus of claim 8, wherein said lens is a Fresnel lens.
  10. The apparatus of claim 8, wherein said lens provides a usable beam of radiation for a distance of approximately 5 to 10 feet from said lens.

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A3  
end
11. The apparatus of claim 8, wherein said lens is removably mounted to said open end.
  12. The apparatus of claim 6, wherein said power supply is a battery.
  13. The apparatus of claim 1, wherein said LED emits radiation having a wavelength in the range of 200 to 550 nanometers.
  14. The apparatus of claim 1, wherein said LED emits radiation having a wavelength in the range of 385 to 465 nanometers.

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A4  
end
15. A method for detecting a fault in a body, comprising the steps of:
    - applying a luminescent material to the body in a manner to concentrate the luminescent material in a pattern indicative of the location of a fault in the body;
    - activating an LED to emit ultraviolet radiation;
    - shining the radiation transmitted from the LED onto the body to excite the luminescent material; and
    - detecting a fault by the fluorescence of the luminescent material indicative of the location of the fault in the body.

16. The method of claim 15, wherein a plurality of LEDs arranged in an array are activated to emit radiation having a wavelength in the range of 385 to 465 nanometers.

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A5  
end
17. The method of claim 15, further comprising the step of focussing said radiation emitted from said array using a lens.
  18. The method of claim 17, wherein said lens is a Fresnel lens.
  19. A method of using an LED for detecting a fault in a body, comprising:
    - applying a luminescent material to the body in a manner to concentrate the luminescent material in a pattern indicative of the location of a fault in the body;

Sub  
A5  
end

activating said LED to emit radiation;  
shining at least a portion of the radiation emitted from said LED onto the body to  
excite the luminescent material; and  
detecting a fault by the fluorescence of the luminescent material indicative of the  
location of the fault in the body.

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20. The method of claim 19, wherein said radiation is near ultraviolet radiation.

21. The use of at least one LED capable of emitting radiation to excite a luminescent material  
for non-destructive fault testing.

22. The use of claim 21, wherein said radiation is near ultraviolet radiation.

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A6

23. A kit comprising:

a lamp including at least one LED housed within said lamp, said LED being  
capable of generating ultraviolet radiation; and  
a luminescent material capable of absorbing at least a portion of said radiation,  
converting said radiation to energy, and emitting said radiation at a visible  
wavelength.

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24. The kit of claim 23, wherein said lamp is a handheld lamp and said LED emits ultraviolet  
radiation in the range of 385 to 465 nanometers.

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